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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,703	12/14/2001	Bradley A. Payne	SNS-009A	5733

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EXAMINER	
NGUYEN, KIMBINH T	

ART UNIT	PAPER NUMBER
2671	6

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,703	PAYNE, BRADLEY A.	
	Examiner	Art Unit	
	Kimbinh T. Nguyen	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,12-27 and 32-40* is/are rejected.

7)☒ Claim(s) *8-11,28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-40 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 6, 17, 21-24, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakalash (5,963,212).

Claim 1, Bakalash discloses defining on a multi-dimensional space an array of geometrical shape (col. 11, lines 6-11; col. 12, lines 13-19; fig. 2); selecting a modification function (skewing function) to be applied to the geometrical shape (employs a linear periodic skewing function which maps each memory storage element m(x,y,z) in C space, into a physical memory storage element m(I,j,k) in M space; col. 12, lines 28-32; figs. 2 and 3); deducing (deriving) from the modified array a modification of the geometrical shape that would result from a direct application of the modification function to the array (col. 12, line 64 through col. 13 line 15; fig. 3). Bakalash does not teach deducing from the modified array that would result from direct application; however; Bakalash computing the physical address indices I,j,k in M space (result from modification) which derives from the linear skew equation (col. 13, lines 42-52) and fig.

3 Bakalash shows a direct application of skewing function of the modification. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a method of reconfigurable parallel computing machine which is particularly suited for generating within 3D memory storage array taught by Bakalash for providing a direct application of the modification, because it would provide a method of generating within memory of a parallel computing system, 3D voxel-based lines, surfaces and solids in discrete 3D Cartesian Space (col. 6, lines 22-24).

Claims 2, 3, Bakalash discloses applying the deduced modification to the array (when controlled (coordinated) by control computing unit 3, the array of local computing units can simultaneously access any rectilinear sequence of memory; col. 13, lines 22-29); displaying the modification of the geometrical shape (display computing unit sends as an I/O; fig. 9).

Claims 4, 6, Bakalash discloses retrieving an array value from the modified array and applying the array value at a location from a first side and second side of the geometrical shape (data stored at a single physical memory location m(I,j,k) and be retrieved by repeatedly accessing the memory location m(I,j,k) a number of times; col. 13, lines 12-15; fig. 3).

Claim 17, Bakalash discloses selecting a second modification function (deskewing function; col. 12, lines 42-46; fig. 3); applying an inverse function of the second modification (deskewing function) to the modified array to produce a twice-modified array fig. 2); deducing from the twice-modified array that would result to the array followed by an application of a second modification to once-modified array (fig. 2).

Claims 21-24 and 26, the rationale provided in the rejection of claims 1-4 and 6 is incorporated herein.

4. Claims 5, 7, 13-16, 18-20, 25, 27, 30, 31, 33-36, 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakalash (5,963,212) in view of Milliron (6,608,631).

Claims 5, 7, 13-16, 18, 19, 20, Bakalash does not teach virtual tool; however, Milliron discloses applying the modification by manipulation of a virtual tool (direct manipulation interface from the user input; col. 18, lines 14-15; col. 21, lines 37-39); the modification comprise a soft-edge deformation (col. 4, lines 12-17); a translational displacement; rotational displacement (col. 13, lines 26-50); Bakalash discloses the modification comprises a selected one of a displacement function (col. 14, lines 36-56), Milliron teaches a smoothing function (col. 30, lines 23-60); a warping function (col. 21, lines 55-57), a volumetric interference , an areal interference; Bakalash and Milliron do not show a volumetric interference , an areal interference; however, it would have been obvious to one of ordinary skill in the art at the time the invention was to include the volume interference, because deformation, warping and force vector method taught by Milliron and Bakalash would relate to an interference between two interaction objects. Milliron teaches a result of a simulation (col. 16, lines 19-37), Bakalash teaches a data refitting (Spatially correct memory storage element location, col. 37, lines 40-65) and a force (col. 36, lines 40-41); Milliron teaches a non-linear mathematical function a discrete transformation computation; col. 17, lines 6-8); Milliron teaches applying a constraint (the direct-manipulation constraints derived from the user input) to control a

magnitude of a change of a geometrical shape (col. 18, lines 21-24); Bakalash teaches applying a surface texture to the geometrical shape (color and attributes of the geometrical object; col. 40, lines 40-67); applying the constraint prevents at least one point of the geometrical shape from moving in response to the inverse function (inverse warping; col. 29, line 39 through col. 30, line 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the geometric deformation in a computer graphics taught by Milliron into the modeling system of Bakalash for calculating a modification of a geometrical shape, because it would provide a useful geometric deformation technique (col. 2, lines 15-16).

Claims 25, 27, 30, 31, 33-36, 38-40, the rationale provided in the rejection of claims 1-7, 10, 11, 13-20 is incorporated herein.

5. Claims 12 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakalash (5,963,212) in view of Stewart et al. (5,973,678).

Claims 12 and 32, Stewart et al. discloses a force field in consistent with a tool of arbitrary shape (col. 3, lines 1-9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the a force feedback interface taught by Stewart into the modeling system of Bakalash for calculating modification of a geometrical shape, because it would provide a method for manipulating a 3D object in a CAD environment utilizing a force feed back interface (col. 1, lines 61-63).

Allowable Subject Matter

6. Claims 8-11, 28 -31 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not teach the geometry shape is displaced away from the virtual tool, toward the virtual tool.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kimbinh Nguyen** whose telephone number is **(703) 305-9683**. The examiner can normally be reached **(Monday- Thursday from 7:00 AM to 4:30 PM and alternate Fridays from 7:00 AM to 3:30 PM)**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Part II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

September 30, 2003

Kimbinh Nguyen

Patent Examiner AU 2671